$\Gamma\left(\frac{4}{i!}\right)$

Assuming i is the imaginary unit

Input

$$\Gamma\left(\frac{4}{i!}\right)$$

Decimal approximation

−265.421544232593607042926153481227643254899162685978993971232349… 222186083… − 875.687943624986658203135440973779933544940283986841569937065538… 915057906… i

More digits

Alternate complex forms

$$\mathrm{Re}\left(\Gamma\left(\frac{4}{i!}\right)\right) + \mathrm{Im}\left(\Gamma\left(\frac{4}{i!}\right)\right) i$$

Approximate form

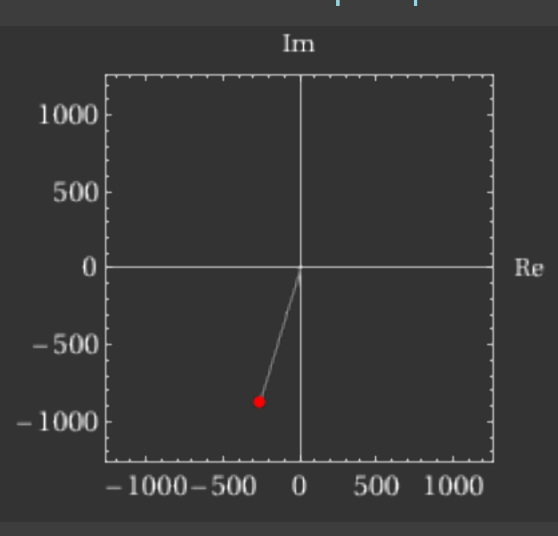
$$\mathrm{Re}\left(\Gamma\left(\frac{4}{i!}\right)\right) + \mathrm{Im}\left(\Gamma\left(\frac{4}{i!}\right)\right) i$$

Approximate form

$$\mathrm{Re}\left(\Gamma\left(\frac{4}{i!}\right)\right) + \mathrm{Im}\left(\Gamma\left(\frac{4}{i!}\right)\right) i$$

Approximate form

Position in the complex plane



Alternate form

$$\Gamma\left(\frac{4}{\Gamma(1+i)}\right)$$

$$\frac{1}{4}\, i!\, \frac{4}{i!}!$$

Continued fraction

[−265 − 876i; −2 − i, 2 + i, 2i, −1 − 3i, −2 − 3i, 1 − 3i, 3i, −1 + i, −1 − 2i, −1 − 2i, −2 + 2i, −2, −1 + 2i, −1 − 2i, −1 − 2i, 1 − 2i, −… 1 + i, −2 − i, 4 − 2i, 1 + 2i, 2i, 1 − 3i, 1 − 4i, 1 + 2i, 3 + i, −3i, 4 + i, 3 + i, 2i, 1 − 3i, −1 + 2i, 2 − 2i, 3, 4 − 2i, −2 + i, 13 + 7i, −4 − 2i, −2, −2 + 2i, −2 − i, 4 + i, 1 + 2i, 2i, 3 − i, 2 − 3i, −2 −… i, 4 + i, 4 − 4i, −1 + 2i, −3 + i, 2i, 2 − i, −5 + i, 3i, 2 + 2i, −1… + 2i, −2 + i, 2 − 4i, 3 − 3i, 1 − i, 1 + i, 3, 1 + 2i, −3 + 3i, −1 … + 2i, 2i, 2 − 2i, −1 − i, −3, 2 + i, −2, 4i]

(using the Hurwitz expansion)

Fewer terms | Fraction form

Alternative representations

$$\Gamma\left(\frac{4}{i!}\right) = e^{-\log G\left(\frac{4}{i!}\right) + \log G\left(1+\frac{4}{i!}\right)}$$

$$\Gamma\left(\frac{4}{i!}\right) = \left(-1 + \frac{4}{i!}\right)!$$

$$\Gamma\left(\frac{4}{i!}\right) = \frac{G\left(1+\frac{4}{i!}\right)}{G\left(\frac{4}{i!}\right)}$$

$$\Gamma\left(\frac{4}{i!}\right) = \Gamma\left(\frac{4}{i!}, 0\right)$$

$$\Gamma\left(\frac{4}{i!}\right) = (1)_{-1+\frac{4}{i!}}$$

$$\Gamma\left(\frac{4}{i!}\right) = e^{\log\Gamma(4/i!)}$$

$$\Gamma\left(\frac{4}{i!}\right) = \left(-2 + \frac{8}{i!}\right)!!\, 2^{1/4\,(3+\cos((8\,\pi)/i!)-16/i!)}\, \pi^{1/2\,\sin^2((4\,\pi)/i!)}$$

Less

Series representation

$$\Gamma\left(\frac{4}{i!}\right) = \sum_{k=0}^{\infty} \frac{\left(\frac{4}{i!} - z_0\right)^k \Gamma^{(k)}(z_0)}{k!} \quad \text{for } (z_0 \notin \mathbb{Z} \text{ or } z_0 > 0)$$

$$\Gamma\left(\frac{4}{i!}\right) = \frac{1}{\sum_{k=1}^{\infty} 4^k \left(\frac{1}{i!}\right)^k c_k} \quad \text{for } \left(c_1 = 1 \text{ and } c_2 = 1 \text{ and } c_k = \frac{\gamma\, c_{-1+k} + \sum_{j=1}^{-2+k} -(-1)^{j+k} c_j\, \zeta(-j+k)}{-1+k}\right)$$

$$\Gamma\left(\frac{4}{i!}\right) = \Gamma\left(\frac{4}{\sum_{k=0}^{\infty} \frac{(i-n_0)^k\, \Gamma^{(k)}(1+n_0)}{k!}}\right) \quad \text{for } ((n_0 \notin \mathbb{Z} \text{ or } n_0 \geq 0) \text{ and } n_0 \to i)$$

$$\Gamma\left(\frac{4}{i!}\right) = \frac{\pi}{\sum_{k=0}^{\infty} \left(\frac{4}{i!} - z_0\right)^k \sum_{j=0}^{k} \frac{(-1)^j\, \pi^{-j+k} \sin\left(\frac{1}{2}(-j+k)\,\pi + \pi\, z_0\right) \Gamma^{(j)}(1-z_0)}{j!\,(-j+k)!}}$$

Integral representations

$$\Gamma\left(\frac{4}{i!}\right) = \int_0^1 \log^{-1+4/i!}\left(\frac{1}{t}\right) dt$$

$$\Gamma\left(\frac{4}{i!}\right) = \Gamma\left(\frac{4}{\int_0^1 \log^i\left(\frac{1}{t}\right) dt}\right)$$

$$\Gamma\left(\frac{4}{i!}\right) = \int_0^\infty e^{-t}\, t^{-1+4/i!}\, dt$$

$$\Gamma\left(\frac{4}{i!}\right) = \exp\left(\int_0^1 \frac{-1 + x^{4/i!} + \frac{4-4x}{i!}}{(-1+x)\log(x)}\, dx\right)$$

$$\Gamma\left(\frac{4}{i!}\right) = \exp\left(-\frac{4\gamma}{i!} + \int_0^1 \frac{1 - x^{4/i!} + \log\left(x^{4/i!}\right)}{\log(x) - x\log(x)}\, dx\right)$$

$$\Gamma\left(\frac{4}{i!}\right) = \frac{2\, i\, \pi}{\oint_L e^t\, t^{-4/i!}\, dt}$$

$$\Gamma\left(\frac{4}{i!}\right) = -\frac{2\, i\, \pi}{\oint_L e^{-t}\, (-t)^{-4/i!}\, dt}$$

$$\Gamma\left(\frac{4}{i!}\right) = \frac{1}{-1 + e^{(8\, i\, \pi)/i!}} \oint_L e^{-t}\, t^{-1+4/i!}\, dt$$

Less

POWERED BY THE **WOLFRAM LANGUAGE**

Related Queries:

- subfactorial(i)
- polar plot r = frac(phi!) from phi = 0 to 5
- handwritten style series n! at n = -3
- cos(x!)!
- last nonzero digit of 100,000!